Evaluation of the efficacy of a new vaccine against bovine mastitis caused by CNS: Field trial results

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Objective

The objective was to evaluate the efficacy of a new vaccine against bovine mastitis caused by Coagulase Negative Staphylococci (CNS) under field conditions.

Materials and methods

The trial was conducted following Good Clinical Practices (VICH) and was multicentric, randomized, double blind, controlled (a parallel negative control group) and stratified (primiparous and multiparous). The vaccine used was STARTVAC® (HIPRA), containing inactivated *Escherichia coli* J5 and *Staphylococcus aureus* SP140 strain expressing Slime Associated Antigenic Complex. A total of 386 healthy gestating cows were used in accordance with the manufacturer proposed vaccine schedule. Incidence of clinical and subclinical mastitis by means of weekly milk sampling by quarters with microbiological analysis and somatic cell counts, spontaneous cure rate, mastitis treatments with pharmacological products and milk production were recorded throughout the observation period (130 days post-partum). Logistic regression and Chi-square test were used for the statistical analysis.

Results and discussion

When we analyze all data of intramammary infections (IMI) caused by CNS, 12 cows of the placebo group and 4 of the vaccinated group showed clinical mastitis. On the other hand, 52 cows of the placebo group and 27 of the vaccinated group showed subclinical mastitis. In both cases statistical differences were observed between treatments (table 1). Primiparous cows were more affected by CNS than multiparous cows. Vaccinated cows showed significant differences in the CNS IMI spontaneous cure rate (table 2), in the amount of mastitis treatments needed (0.59% of the vaccinated cows and 4.02% of the control group required mastitis treatments), and in the no. of cows that reduced its milk yield in comparison to the control group (table 3).

Table 1: Percentage of new cases [number of cases] of clinical and subclinical mastitis caused by CNS until day 130:

	Treatment		**Significance (P-value)**
	Control	**Startvac**	
Clinical Mastitis			
Primiparous	8.33 [7]	2.22 [2]	0.069
Mutiparous	5.56 [5]	2.53 [2]	0.326
Overall	6.9 [12]	2.37 [4]	0.047*
Subclinical Mastitis[1]			
Primiparous	34.52 [29]	17.78 [16]	0.01*
Multiparous	25.55 [23]	13.92 [11]	0.058
Overall	29.89 [52]	15.98 [27]	0.002*

* $p<0.05$ [1] Subclinical mastitis: CNS isolation + SCC>200.000 cells/ml

Table 2: Percentage [number of cases] of spontaneous cure rate of CNS infections[2] and mastits treatments:

	Treatment		Significance (P-value)
	Control	**Startvac**	
Primiparous[2]	40 [12]	56.25 [9]	0.292
Multiparous[2]	19.23 [5]	50 [6]	0.057
Overall[2]	30.36 [17]	53.57 [15]	0.040*

* $p<0.05$ [2] Cows that received any antibiotic treatment were removed from the analysis.

Table 3. Cows with milk yield reduction and percentage of milk reduction of the animals with IMI by CNS:

	Control	**Startvac**	**P value**
Percentage of cows that significantly reduced the milk yield [3] [no. of cows]	9.19[16]	2.36[4]	0,07*
Percentage of milk reduction[4]	-41.2%	-33%	0,162

[3] Reduction in milk yield > 2 std. dev. (> 8 litres) of the estimated individual curve
[4] Reduction of the milk yield in % with respect to the expected curve

Conclusion

Startvac® is efficacious in reducing the incidence of IMI due to CNS, in the period of maximum incidence (i.e. post-parturition). Immunization also improve the spontaneous cure rate of CNS IMI, reduces the number of mastitis treatments needed and the percentage of cows with significant decrease in the expected milk yield.